

REMARKS

This application has been reviewed in light of the Office Action dated November 2, 2004. In view of the foregoing amendments and the following remarks, favorable reconsideration and withdrawal of the objection and rejection set forth in the Office Action are respectfully requested.

Claims 1, 4 and 7-10 are pending. Claims 2, 3, 5 and 6 have been canceled herein without prejudice or disclaimer of subject matter. Claims 1, 4, 7 and 8 have been amended. Claims 9 and 10 have been added. Support for the claim changes and added claims can be found in the original disclosure, and therefore no new matter has been added. Claims 1, 9 and 10 are in independent form.

The Office Action requires that Figures 9A, 9B and 9C be labeled "Prior Art." Corrected formal drawings for those figures, amended as required by the Office Action, are submitted herewith. Accordingly, withdrawal of this objection is respectfully requested.

Claims 1-8 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,489,930 (*Anderson*). Since Claims 2, 3, 5 and 6 have been canceled, the rejection of those claims is moot. In response to the rejection of the other claims, Applicants respectfully submit the following remarks.

For at least the following reasons, the independent claims are believed allowable over the cited art.

Independent Claim 1, recites, *inter alia*, that (i) a diameter of each nozzle is not greater than a distance between a surface of an element base plate on which discharge energy-generating elements are formed and a surface of a flow-path-forming base plate opposed to

the surface on which the discharge energy-generating elements are formed in a respective supply path, and (ii) a flow path structure is provided with (a) a first structure for closing a part of each supply path, the first structure being formed on the surface of the element base plate having the discharge energy-generating elements formed thereon, and (b) a second structure formed on the flow-path-forming base plate to be a columnar structure extending from the first structure, the second structure also being for closing a part of each supply path.

Each of independent Claims 9 and 10 recites features similar to the above-noted features of Claim 1. In addition, each of Claims 9 and 10 recites, *inter alia*, that a length of a gap between adjacent columns of a columnar structure, in a height direction of a supply path, is shorter than a diameter of a discharge port.

The claimed relationships between the height of the supply path, the height of the gap between adjacent columns, and the diameter of the nozzle are supported in the specification, for example, in the first embodiment, in which the diameter of the discharge port is 10 μm , the height of the supply path is 10 μm , and the height of a column is 7 μm (see page 19, lines 1-5 and page 21, line 20), and in the third embodiment, in which the diameter of the discharge port is 8 μm , the height of the supply path is 10 μm , and the height of a column is 6 μm (see page 28, lines 16-20 and page 31, lines 2-3).

According to the claimed invention, a side-shooter type ink jet recording head includes a filter, formed by a columnar structure, between a supply port and a discharge port. The height of the supply path is greater than or equal to the diameter of the discharge port, and a filter portion is raised. The filter serves to block dust from proceeding into the supply path and also to secure tight adhesion between base plates.

According to the prior art, the height of the flow path could not be freely designed. If the diameter of the discharge port was made small and the height of the flow path was reduced in view of the small discharge port diameter, there was a concern that a satisfactory supply of liquid into the flow path could not be obtained. Accordingly, the diameter of the discharge port was made less than or equal to the height of the flow path. However, with respect to a columnar filter, the length of the gap between adjacent columns, in the direction of the height of the flow path, was determined by the height of the flow path, so that there was a concern that a dust particle larger than the diameter of the discharge port could pass through the filter.

The claimed invention serves to remedy this problem. Specifically, at a portion where the filter is provided, a structural member is also provided, to block a portion of the supply path in the vertical direction. The structural member may be provided across the entire width of the supply path. With the provision of the structural member, the length of the gap between adjacent columns of a columnar filter, in the direction of the height of the supply path, can be made shorter than the diameter of the discharge port. Accordingly, dust particles larger than the discharge port diameter can be prevented from passing through the filter.

Anderson relates to an ink jet head with an internal filter. The filter is made of overlapping filter portions 100 and 102, each of which has an array of holes 120. The two filter portions are juxtaposed (one above the other) so that the holes of one partly overlap the holes of the other. The areas of overlap define filter pores (holes) 142 smaller than the holes 120 in each filter portion. Applicants submit that nothing in *Anderson* would teach or suggest the above-noted features of Claim 1, namely, that (i) a diameter of each nozzle is not greater

than a distance between a surface of an element base plate on which discharge energy-generating elements are formed and a surface of a flow-path-forming base plate opposed to the surface on which the discharge energy-generating elements are formed in a respective supply path, or (ii) a flow path structure is provided with (a) a first structure for closing a part of each supply path, the first structure being formed on the surface of the element base plate having the discharge energy-generating elements formed thereon, and (b) a second structure formed on the flow-path-forming base plate to be a columnar structure extending from the first structure, the second structure also being for closing a part of each supply path.

Applicants further submit that nothing in *Anderson* would teach or suggest the above-noted feature of Claims 9 and 10, namely, that a length of a gap between adjacent columns of a columnar structure, in a height direction of a supply path, is shorter than a diameter of a discharge port. Applicants further submit that nothing in *Anderson* would teach or suggest the features of Claims 9 and 10 that are similar to the above-noted features of Claim 1.

For at least the reasons given above, *Anderson* is not understood to teach or suggest all of the elements of any of independent Claims 1, 9 and 10. Accordingly, those claims are believed allowable over the cited art.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as a reference against the independent claims herein. Those claims are therefore believed patentable over the art of record.


The other claims in this application are each dependent from independent Claim 1 and are therefore believed patentable for at least the same reasons. Since each dependent

claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



Attorney for Applicants
Douglas W. Pinsky
Registration No. 46,994

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200
DWP/tmc

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